

## OVERHEAD CONSOLE FOR A VEHICLE

### TECHNICAL FIELD

The present invention relates to an overhead console assembly for the  
5 interior of a vehicle.

### BACKGROUND ART

Overhead consoles are provided on the interior roof structures of  
vehicles such as automobiles, boats and airplanes. Overhead consoles generally are  
centrally mounted on the longitudinal axis of the headliner of the vehicle roof.  
10 Overhead consoles are designed to provide passengers of the vehicle additional  
storage space for items such as sunglasses, garage door openers and compact discs.

Current overhead console systems include a series of accessory  
compartments for storing items of the passengers in the vehicle. The accessory  
compartments are pivotally mounted to the console to allow the passenger to stow  
15 and retrieve personal items in the console. Additionally, overhead consoles house  
vehicle accessories and controls for vehicle components, including overhead lighting  
fixtures and controls for vehicle air conditioning systems. Many overhead consoles  
further include television monitors and the like which are installed in the vehicle for  
viewing by the passengers.

20 Once the overhead consoles have been assembled in the vehicle,  
additional accessory compartments not previously installed cannot be added to the  
console without a complete rebuild of the console. For example, a garage door  
opener mechanism cannot be installed into an overhead console unless the console  
was originally built to house the device. Further, accessory compartments fixed in  
25 the overhead consoles do not allow vehicle passengers to rearrange the positioning  
of each compartment based on driver or passenger preference. Finally, passengers  
cannot remove the accessory compartments from the console to transport the stored

items. Rather, the items must be removed from the compartments prior to exiting the vehicle.

Therefore, it is desirable to provide an overhead console assembly in a vehicle having modular accessory compartments that can be easily removed, 5 replaced or rearranged by the occupants of the vehicle.

### DISCLOSURE OF INVENTION

The present invention overcomes the above-referenced problems associated with prior overhead console assemblies by providing an overhead console assembly for a vehicle having accessory module compartments removably secured 10 to the overhead console for storing materials within the compartments. The overhead console assembly includes a first console housing disposed to an inner surface of a structural member of a headliner assembly mounted to a roofline of a vehicle, a second console housing disposed on the structural member of the headliner of the vehicle spaced apart from the first console housing and a center console housing 15 disposed between the first and second console housings. At least one accessory module for storing materials within the overhead console of the vehicle is removably secured to the center console housing. The at least one module includes a housing, a storage area defined within the housing to retain the materials stored there within, and at least one securing member coupling the at least one module to at least one 20 securing surface provided on the center console housing.

In a first embodiment of the invention, the overhead console assembly includes a first console housing disposed to an inner surface of a structural member of a headliner assembly mounted to a roofline of a vehicle, a second console housing disposed on the structural member of the headliner spaced apart from the first 25 console housing and a center console housing disposed between the first and second console housings. The first and second console housing may be either attached to or integrally formed as part of the structural member of the headliner assembly of the vehicle.

The center console housing disposed between the first and second console housings includes at least one rail extending between and secured to the first and second console housings. In one embodiment of the invention, a pair of rails are spaced apart between and attached to the first and second console housings. Each 5 rail has a securement surface provided about the outer periphery of the rail to receive the securing members of the at least one accessory module and an inner surface defining a cavity therein which receives electrical wiring or the like. The at least one accessory module includes a housing, a storage area defined within the housing to retain the materials and a gripping portion extending from each end of a lower 10 surface of the housing to engage the outer surface of each of the pair of spaced apart rails to secure the module to the center console housing. The at least one accessory module is selectively repositionable on and within the center console housing for the convenience of the occupants of the vehicle.

In a second embodiment of the invention, the overhead console 15 assembly includes a first console housing disposed on an inner surface of a structural member of a headliner assembly mounted to a roofline of a vehicle, a second console housing disposed on the structural member of the headliner spaced apart from the first console housing and a center console housing disposed between the first and second console housings mounted on the structural member of the headliner. The 20 center console housing disposed between the first and second console housings comprises an upper surface substantially flush to the inner surface of structural member of the headliner, a pair of sidewalls extending vertically from the upper surface between the first and second console housings, and a cavity defined there between. At least one securement surface is provided in the cavity of the center 25 console housing. In an alternative embodiment of the present invention, the first, second and center console housings are integrally formed as part of the structural member of the headliner assembly of the vehicle.

At least one accessory module is selectively positioned removably secured in the center console housing. The at least one module of the second 30 embodiment of the invention includes a lower surface, an overlapping flap portion extending from the lower surface a storage area formed between the lower surface

and flap portion and an upper surface having a fastening material, such as a hook and loop fastener, which engages the at least one securement surface in the cavity of the center console housing to secure the at least one module in the cavity. The at least one module is selectively repositionable within the cavity of the center console 5 housing based on the convenience of the occupants of the vehicle. The overlapping flap portion of the at least one module is removably fastened to the lower surface to enclose materials within the storage area.

10 The above objects and other objects, features and advantages of the present invention are readily apparent from the following detailed description of the best mode for carrying out the invention when taken in connection with the accompanying drawings.

#### **BRIEF DESCRIPTION OF DRAWINGS**

15 FIGURE 1 shows a fragmentary perspective view of a first embodiment of a modular overhead console assembly for a vehicle wherein a plurality of removably secured accessory modules are disposed on a pair of spaced apart rails in accordance with the present invention;

FIGURE 2 shows a perspective view of an accessory module of the first embodiment of the modular overhead console assembly of the present invention;

20 FIGURE 3 shows a fragmentary perspective view of the second embodiment of the modular overhead console assembly for a vehicle, wherein a plurality of detachably coupled accessory modules are disposed in the center console housing of the overhead console assembly of a vehicle in accordance with the present invention;

25 FIGURE 4 shows a top plan view of a lower surface of the second embodiment of the modular overhead console assembly of the present invention;

FIGURE 5 shows a bottom plan view of an upper surface of the second embodiment of the modular overhead console assembly of the present invention; and

5 FIGURE 6 shows a top plan view of another accessory module of the second embodiment of the modular overhead console assembly of the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

10 Referring to Figure 1, a roof structure 10 of a vehicle is shown in accordance with the present invention. The roof structure 10 is comprised of a roof panel 12 having an outer surface 14 and an inner surface 16. Typically, roof panel 12 is formed as a one piece, stamped structure. However, roof panel 12 can be formed as a one piece structure using two pieces, wherein outer roof surface 14 is crimped around the outer periphery of inner roof surface 16 to complete construction of the one piece roof panel 12.

15 A headliner assembly 18 includes a structural member 20 which is secured to the inner surface 16 of roof panel 12 by fasteners or the like. The upper surface of headliner assembly 18 covers the inner surface 16 of roof panel 12. The headliner assembly 18 comprises a structural member 20 and an overlay 22 applied to a lower surface of structural member 20. Structural member 20 of headliner assembly 18 is molded to provide contour surfaces defining or complementary to the shape of the interior roof of the vehicle. The overlay 22 of headliner assembly 18 is comprised of a polymer such as polypropylene or the like. Overlay 22 is placed over the lower or interior surface of structural member 20 and is secured by adhesive applied between the overlay 22 and the lower surface of structural member 20.

20 The structural member 20 of headliner assembly 18 includes a series of mounting structures adapted to receive and secure interior components of the vehicle. The most common interior components provided on the headliner assembly 18 include a pair of visors 24 mounted at a front edge 26 of the headliner 18, as well

as grab handles 28, 30 and interior lights 32, 34 mounted on opposing sides 36, 38 of the headliner assembly 18. It is understood that any number of additional components can be mounted to the headliner assembly for use in a vehicle, including clothes hooks and additional interior reading lights.

5 Referring now to Figures 1 and 2, overhead console assembly 40 is centrally disposed along the longitudinal axis of headliner assembly 18. Overhead console assembly 40 includes a first console housing 42, a center console housing 43 and a second console housing 44. In the preferred embodiment of the invention, first console housing 42 of overhead console assembly 40 is disposed on structural member 20 of headliner assembly 18 between visors 24 at a front edge 26 of headliner 18. In another embodiment of the invention, first console housing 42 is integrally molded as part of structural member 20 of headliner assembly 18. The first console housing 42 of overhead console assembly 40 is adapted to receive a number of interior components, including, but not limited to, overhead reading lights 48 and an electronic information center 50. First console housing 42 includes a pair of apertures (not shown) which receive a pair of rails 60, 62 of center console housing 43 extending between the first and second console housings 42, 44.

20 Second console housing 44 of overhead console assembly 40 is disposed on a central portion 46 of structural member 20 of headliner assembly 18. Second console housing 44 is assembled to the structural member 20 of headliner assembly 18 with a series of fasteners (not shown). This allows a manufacturer to vary the length of the overhead console assembly based on the assembly position of the second console housing 44. In the preferred embodiment of the invention, second console housing 44 is disposed rearward of first console housing 42 along the longitudinal axis of the structural member 20. However, it is understood that the first and second console housings 42, 44 could be disposed parallel to and spaced apart from one another along the lateral axis of the structural member 20. In an alternative embodiment of the invention, second console housing 44 is molded as part 25 of structural member 20 of headliner assembly 18.

Second console housing 44 is substantially rectangular in shape, having vertically extending sidewalls 52 terminating at a lip 53 disposed about the outer periphery of sidewalls 52. A cavity 54 is defined between the vertically extending sidewalls 52 of second console housing 44. Second console housing 44 5 includes a pair of apertures (not shown) adapted to receive and secure rails 60, 62 of center console housing 43. An audiovisual display 56 is pivotally mounted within the cavity 54 of second console housing 44. The display 56 is secured in cavity 54 by a set of fasteners covered by a trim bezel (not shown). Display 56 is pivotally adjustable between a raised or inactive position and an active or lowered position, 10 which is shown in Figure 1.

When the audiovisual display 56 is in the inactive or stored position, the display 56 is disposed within cavity 54 such that the viewing surface 58 of display 56 is substantially flush with the outer periphery 52 of second console housing 44. A latch 59 is provided on the outer periphery 52 of second console housing 44 of overhead console assembly 40 to lock the display in cavity 54 while stored in the inactive position. When the audiovisual display is placed in the active or lowered position, the display 56 is substantially perpendicular to the lower surface of headliner 18. It is understood that the monitor could be pivotally adjusted to any number of positions relative to the lower surface of headliner assembly 18 for use by 15 the passengers of the vehicle. 20

In a first embodiment of the invention, center console housing 43 of overhead console assembly 40 includes a pair of rails 60, 62 mounted between the first and second console housings 42, 44. The rails 60, 62 are substantially parallel to one another and are spaced apart to receive at least one accessory module 64 there 25 between. As described above, rails 60, 62 can be formed to any length to extend between first and second console housing 42, 44. Rails 60, 62 are formed by an extrusion process using either a metallic material, such as aluminum, or a polymeric material, such as polypropylene or the like. Rails 60, 62 are generally cylindrical in shape to allow accessory modules 64 mounted on the rails to be adjusted 30 longitudinally along the surface of the rails. It is easily understood that rails 60, 62 can be formed to have any geometrical shape which would allow for the mounting

and adjustment of the removably secured accessory modules 64 along the rails based on the convenience of the occupants of the vehicle.

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~~5 In an alternative embodiment of the invention, a single rail is provided as part of the center console housing 43 extending between the first and second console housings 42, 44. The at least one accessory modules 64 are selectively positionable and removably secured to the single rail in center console housing 43. It is also understood that the number of rails provided in center console housing 43 of overhead assembly 40 can be changed to provide additional structural support to mount the accessory modules 64 or to change the aesthetic appearance of the overhead assembly.~~

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Referring now to Figure 2, each rail 60, 62 includes a hollow inner surface 66 and a securement surface 68 provided about the outer periphery of the rails. Electrical wiring 70 connecting the interior components of overhead console assembly 40 to the vehicle's electrical system, including overhead lights 48, 15 information center 50 and audiovisual display 56 is disposed within the hollow inner surface 66 or rails 60, 62.

At least one accessory module 64 is selectively positionable and removably secured on rails 60, 62. The accessory modules 64 are adapted to be repositioned along and removed from the spaced apart rails 60, 62 of center console housing 43 based on the convenience of the occupants of the vehicle. Accessory modules 64 receive and retain personal items or materials of the passengers in the vehicle. Examples of the type of accessory modules that can be mounted to the overhead console assembly 40 include, but are not limited to, a tissue dispenser module 72, a sunglass holder module 74 and a universal garage door opener module 76. Each of the accessory modules can have different geometries and features based 20 25 on the type of materials to be retained in the module and still be secured to center console housing 43.

Each accessory module 64 includes a substantially planar lower surface 78 terminating at each end at a gripping portion 80, 82. The gripping

portions 80, 82 are adapted to engage the securement surface 68 of rails 60, 62 to mount the accessory module 64 to the rails. In the preferred embodiment, gripping portions 80, 82 are arcuate shaped to engage the cylindrical outer periphery of securement surface 68 of rails 60, 62. However, it is understood that the position, 5 geometry and number of gripping portions provided on the accessory modules may be changed to mount the accessory modules to the overhead assembly.

The accessory module 64 further includes a storage receptacle formed by vertically extending side walls 84, 86 terminating at a substantially planar top surface 88. The storage receptacle formed by the vertically extending side walls 84, 10 86 and top surface 88 extends into the area defined between the spaced apart rails 60, 62. Passengers access the materials in the storage receptacle through an entry 90 formed in the substantially planar lower surface 78. It should be understood that the entry for each accessory module 64 can be varied based on the purpose of the module. For example, tissue dispenser module 72 has a rectangular entry formed in 15 the lower surface to provide access to the tissue stored in the receptacle.

It can be further understood that in another embodiment of accessory module 64 of the present invention, accessory module 64 includes an aperture formed in the lower surface 78 of the accessory module 64 above a cavity in module 64 which may receive a number of interchangeable accessory components. The aperture and cavity are defined by the vertically extending sidewalls 84, 86 and top surface 88 of accessory module 64. For example, universal garage door opener module 76 receives a removable garage door opener device mounted in the storage cavity 20 through the aperture in lower surface 78. If the passenger decides to replace the garage door opener device, he removes the device from the storage cavity, replacing 25 the device with another container in the accessory module, such as a sunglass carrier.

Referring now to Figure 3, a second embodiment of the modular overhead console for a vehicle of the present invention is disclosed. Vehicle roof 100 comprises a roof panel 102 having an outer surface 104 and an inner surface 106. An upper surface of a structural member 110 of headliner assembly 108 is secured 30 to the inner surface 106 of roof panel 102 by fasteners (not shown).

The headliner 108 of vehicle roof 100 comprises a structural member 110 and an overlay 111 applied to a lower surface of the structural member 110. Overhead console assembly 112 includes a first console housing 114, a center console housing 116 and a rear console housing 118. Each of the housings forming 5 the overhead console assembly 112 is aligned with an adjacent housing and is centrally disposed along the longitudinal axis of structural member 110 of headliner assembly 108. However, it is understood that the housings of overhead console assembly may be aligned with one another along the lateral axis of the structural member 110 of headliner assembly 108.

10 In the second embodiment of the invention shown in Figure 3, first console housing 114, center console housing 116 and second console housing 118 are molded as part of the structural member 110 of headliner 108. Overlay 111 extends over each console housing of overhead console assembly 112. In another embodiment of the invention, first console housing 114, center console housing 116 15 and second console housing 118 can be individually secured to the headliner assembly 108 by fasteners. Additionally, each housing can be assembled together to form the overhead console assembly 112 prior to assembly on the structural member 11 of headliner assembly 108.

20 First console housing 114 of overhead console assembly 112 is disposed at a front edge 124 of headliner 108. A pair of visors 126 are secured on each side of first housing 114. The first housing 114 of overhead console assembly 112 is adapted to receive interior components, such as overhead lights 128 and an electronic information center 130.

25 Center console housing 116 of overhead console assembly 112 includes a pair of vertical sidewalls 132, 134 extending longitudinally from first console housing 114. Electrical wiring (not shown) is provided in the cavities formed by vertically extending sidewalls 132, 134 to electrically connect components in the first and second console housing 114, 118 to the vehicle electrical system. A cavity 136 in center console housing 116 is defined between vertically extending 30 sidewalls 132, 134 and first and second console housings 114, 118. Cavity 136 is

provided substantially flush to the structural member 110 of headliner assembly 108 and is adapted to removably secure and detachably couple at least one accessory module or pouch 138 therewithin with a hook and loop fastening system, which will be described in greater detail below.

5                   Second console housing 118 of overhead console assembly 112 is disposed adjacent center console housing 116. Second console housing 118 is formed by the vertically extending sidewalls 132, 134 and an end wall 140 extending between the terminal portions of sidewalls 132, 134. A cavity 142 is defined between the vertically extending sidewalls 132, 134, the end wall 140 and center console 10 housing 116 to receive an audiovisual display 144.

15                  Audiovisual display 144 is pivotally mounted within the cavity 142 of second console housing 118 to be adjusted between a raised or inactive position and an active or lowered position. A latch 146 is provided in cavity 142 to engage and lock the audiovisual display 144 when the display is placed in the inactive or stored position. When stored, viewing surface 148 of display 144 is substantially flush with the outer periphery 150 of second console housing 118.

20                  ~~Referring additionally now to Figure 4-6, the accessory module or pouch 138 of the alternative embodiment of the modular overhead console of the present invention will be discussed in greater detail. Accessory pouch 138 includes a lower surface 152, an upper surface 154, a flap 156 and a storage cavity 158 formed by the upper and lower surfaces 152, 154. Items 160, such as a garage door opener or the like, are stowed in storage cavity 158. Items 160 are retained in cavity by flap 156, which is releasably secured to the lower surface of accessory pouch 138 by means of a fastener, such as a snap fastener or a hook and loop fastener.~~

25                  As is seen in Figure 6, another embodiment of an accessory module or pouch is disclosed. Accessory pouch 162 is formed as a tissue dispenser having a lower surface 164 including an aperture 166, an upper surface 168 and a storage cavity 170 defined there between. The accessory modules or pouches 138, 162 are generally formed of a polymeric material. In the preferred embodiment of the

invention, accessory pouches 138, 162 are formed of a transparent polymeric material to allow passengers of the vehicle to view the contents of the pouch. It is understood that accessory pouches 138, 162 can be formed to have different geometries and features based on the types of materials to be retained in the module 5 and still be secured to center console housing 116.

Accessory modules or pouches 138, 162 include a hook and loop fastening material 172 provided on the upper surface 154 of accessory pouch 138 to selectively position and removably secure mount the at least one accessory pouch to a securement surface in the cavity 136 of center console housing 116. When the 10 accessory pouch is placed in cavity 146, hook and loop fastening material 172 interconnects with the overlay 111 provided in cavity 136 to detachably couple and secure the accessory pouch 138 in position. Overlay 111 acts as a securement surface to removably secured the accessory pouches to center console housing 116.

In another embodiment of the invention, a hook and loop fastener 15 securement panel 173 is mounted within cavity 136 and is provided as the securement surface of the center console housing to engage fastening material 172 of accessory pouches 138, 162 to provide a more secure interconnection between the center console housing and the accessory pouches than that provided by overlay material 111. It is understood that accessory pouches 138, 162 of overhead console assembly 20 112 are selectively repositionable and removable within cavity 136 of center console housing 116 based on the convenience of the occupants of the vehicle.

While the best mode for carrying out the invention has been described in detail, those familiar with the art to which this invention relates will recognize various alternative designs and embodiments for practicing the invention within the 25 scope of the appended claims.